

## Buchbesprechungen

GANSLOSSER, U.; HODGES, J. K.; KAUMANN, W. (eds.): **Research and Captive Propagation**. Fürth: Filander Verlag 1995. 338 pp., some illustrations and tables, paperback. 49,80 DM. ISBN 3-930831-01-5.

At first glance the title of this book is enigmatic: The general reader might ask questions as to what group of living beings the title refers: Plants or animals, invertebrates or vertebrates, anamniotes or amniotes, etc. Inspecting the book more closely, the reader learns that its contributions deal with birds and mammals in zoos.

After a short foreword by G. NOGGE, the President of the World Zoo Organisation, the table of contents lists 32 contributions authored by different researchers. This table lacks typographical differentiation and thus does not clearly show how the book is structured. According to the reviewer's impression there are six sections:

The editors give an introductory chapter on the scientific basis for animal management and conservation.

The following eight chapters deal with genetics, reproductive biology and technical problems of propagation of captive animals.

Four chapters deal with nutritional ecology, gastrointestinal anatomy, energetics and thermoregulation, as well as with Vitamin A and carotenoid metabolism.

Eleven chapters deal with behavioural aspects.

Breeding programmes in zoos, examples of biological research in these institutions and veterinary studies are presented in seven contributions.

Finally, two of the editors (W. KAUMANN and U. GANSLOSSER) discuss – in an “evolutionary approach” – propagation in captive animals.

Most of the various contributions are followed by extensive lists of references. Some articles include tables or are illustrated. Diagrams and tables are clearly printed and easily legible, but half-tone illustrations, such as those on pages 50, 52 and 182 are practically worthless because of the very low quality of print!

In a book like the present one it is impossible to comment on all contributions. As is to be expected with a multi-authored book, the quality of the chapters is highly variable. Some articles present declaratory texts, and it has to be feared that they are just produced “for the files.” However, the publication also includes interesting contributions concerning which the reviewer has chosen to make a few remarks.

C. P. GROVES emphasizes in his chapter that subspecies “can never be unscrambled” “once they have been mixed up”. It is therefore necessary “to embark before it is too late on widespread taxonomic revisions of conservation-significant groups: what are the species, what are the subspecies, and how may they be distinguished?” (p. 28).

I. D. HUME discusses general concepts of nutrition and nutritional ecology and physiology. For the context of this book it is of great importance that the author emphasizes non-invasive and non-stressful experiments on nutrition and comparative physiology of animals in zoos. The reviewer believes that administrators of zoos should generally make their animals available to this type of experiments. This aspect is extended to natural history museums by K. LEUS and A. A. MACDONALD. These institutions must be encouraged to continue playing their traditional and vital role in the conservation of material for future research. C. WALZER and A. A. MACDONALD emphasize veterinary studies in zoos. The reviewer can only endorse the authors' statement that anatomists should be “responsible for the description of their species or group, ...” (p. 331), but he is sceptical that descriptive investigations by pathologists, as they are also recommended, can present more than post-mortem case histories of animals. This knowledge is important for the managers of the respective zoo, but it does not really extend our knowledge about basic information on the species.

E. MÜLLER presents a paper based on extensive studies of the energetics and thermoregulation in mammals and birds. From his results he is able to give recommendations on the thermal environment appropriate for species in captivity.

An interesting aspect is discussed in the study by C. HÖLZER et al. on the adaptation of captive-born

New Zealand takahes (*Porphyrio mantelli*) to non-captive life. The authors demonstrate that intensive training of "naive" birds to recognize their predator can be a promising approach before the animals are released.

For many non-specialist visitors elephants are probably the most important exhibit in zoos. F. KURT and G. B. HARTL discuss Asian elephants (*Elephas maximus*); they deal with management practices, characterize health and behavioural problems and present recommendations to cope with them.

P. LANGER, Gießen

KIELAN-JAWOROWSKA, Z.; GAMBARYAN, P. P.: **Postcranial anatomy and habits of Asian multituberculate mammals**. Fossils and Strata No. 39. Oslo, Kopenhagen, Stockholm: Scandinavian University Press 1994. 92 pp., 61 figs., 6 tabs. ISSN 0300-9491, ISBN 82-00-37650-8.

Multituberculata is an extinct group of mammals which endured from the late Jurassic (or even late Triassic if haramyids are included) to the end of the Eocene, thus spanning a time period of 150 million years.

Multituberculates were the most diverse of Mesozoic mammals and their extinction during the Paleogene has been attributed to competition with herbivorous eutherians. Multituberculates have been placed in a separate subclass, the Allotheria, and currently there are several competing hypotheses of relationship to the three subclasses of extant mammals, monotremes, marsupials, and placentals. Although dental remains are rather common and diverse, postcranial bones are rare and mainly known of North American taxa.

The present study by two leading experts in Mesozoic mammals and mammal locomotion is based on a large number of postcranials of six Late Cretaceous multituberculate species from the Gobi Desert. The goal of the study is to describe in detail the skeletons and to reconstruct the musculature and habits of the animals. The minute size and the articulated condition of the fossils provide some drawbacks in this regard. The osteological descriptions of Part One of the monograph are well-complemented by photographs (mainly stereo-pairs) and clear line-drawings. A suite of new multituberculate autapomorphic and plesiomorphic characters is elaborated. The second part on muscular reconstructions looks somewhat tentative, as admitted by the authors themselves. Muscle attachments, in particular of smaller muscles, are in no way generally delimited by muscle scars or depressions on the bone. Multituberculates depart, on the other hand, in so many skeletal characters from therians that it appears highly speculative to transfer muscular arrangements of the latter to multituberculates in all details.

The following Parts Three and Four provide anatomical comparisons with other extant and fossil mammals and functional analyses, with an emphasis on locomotion and the multituberculate pes. Particular multituberculate features include: Cervical ribs, incipient supraspinous fossa and peg-like acromion, strongly twisted humerus, deep pelvis and large ilio-sacral angle, calcaneo-metatarsal V contact, and peculiar astragalonavicular articulation. The Late Cretaceous *Nemegtbaatar* is reconstructed with a rather sprawling stance and the authors conclude a digitigrade, terrestrial runner with an asymmetrical gait. The fore- and hindlimbs would have been abducted to some extent during locomotion.

Plesiomorphies and apomorphies of multituberculates are finally summarized and presumable habits and causes of extinction are discussed. Multituberculates are considered a sistergroup to all the other mammals. It is suggested that these Late Cretaceous Asian taxa were nocturnal semi-desert dwellers. Competitive inferiority to therians might have been related to the structure of the pelvis with a long ventral keel (short gestation period with extremely small neonates) and the abducted limbs (limited endurance for running long distances).

Multituberculates must have adapted to a variety of niches in their long-lived radiation while the present results are obtained from chronologically and geographically restricted samples. Another Cretaceous multituberculate from Mongolia, for example, was shown just recently to have possessed a forelimb like that of therians which was swung parasagittally and, moreover, some early Tertiary multituberculates from North America have been obviously arboreal. Nevertheless, this monograph will certainly become standard in vertebrate paleontology by the high quality of the analyses and the beautiful specimens described therein.

G. STORCH, Frankfurt/M.